IFLY-C6W Multi Rotor Autopilot User Manual

Disclaimer

This product is not a toy! It is a complicated combination of mechanics, electronics, and aerodynamics and high-frequency radio technologies. Users should strictly obey safety operation specification on aerial model and follow steps illustrated in the manual to install and calibrate the product. Idea-fly takes no responsibility for any direct or indirect damages or injuries caused by improper installation calibration and operation.

This product is not suitable for people under the age of 12.

Product introduction

1、Component List

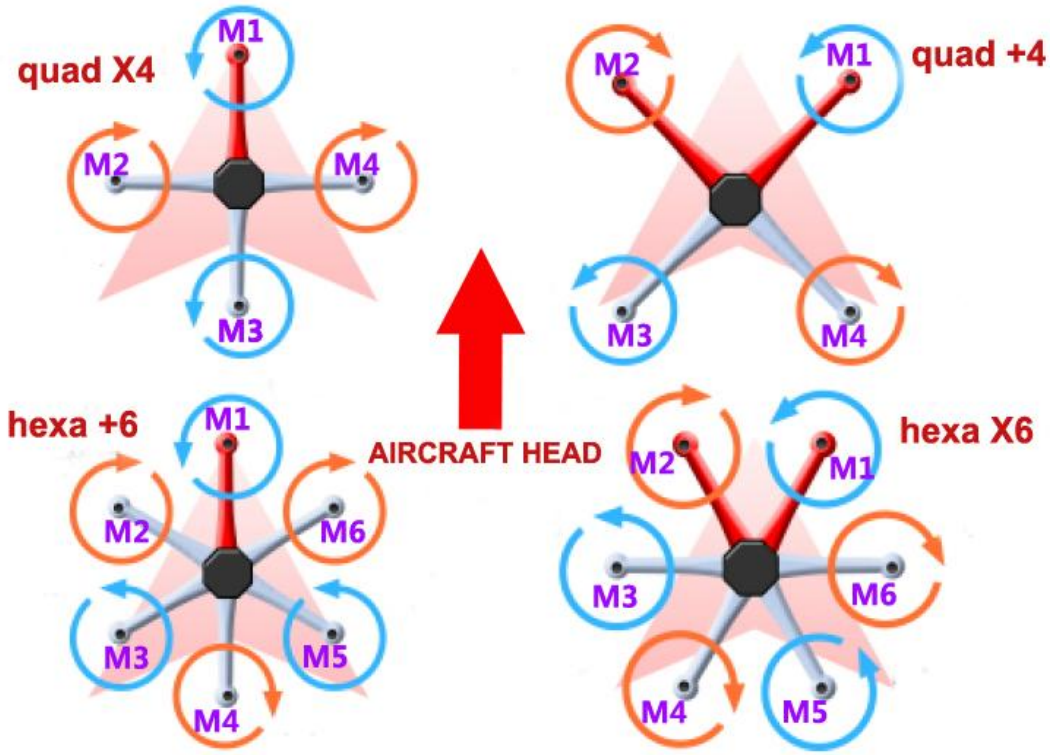
IFLY-C6W autopilot includes AP bare board, GPS&COMPASSS module (GPS module for short), LED indicator, and the related cables

LED

GPS

2、Main Functions

1. Support 4 motor layouts: quad X4, quad +4, hexa X6, hexa +6.



Shown as above, M1-M6 represent the sequence number of the motors (eg:M1 represents the first motor), the blue arc arrow around each motor represents the turning direction of the related propellers.

NOTE: the motors and the propellers must be installed following the methods shown as above, for safety, please take off the propeller when testing on the ground and power off when fixing the propellers.

2、Working Modes:

Manual stabilization, Auto hover, RTH& Land, Head free.

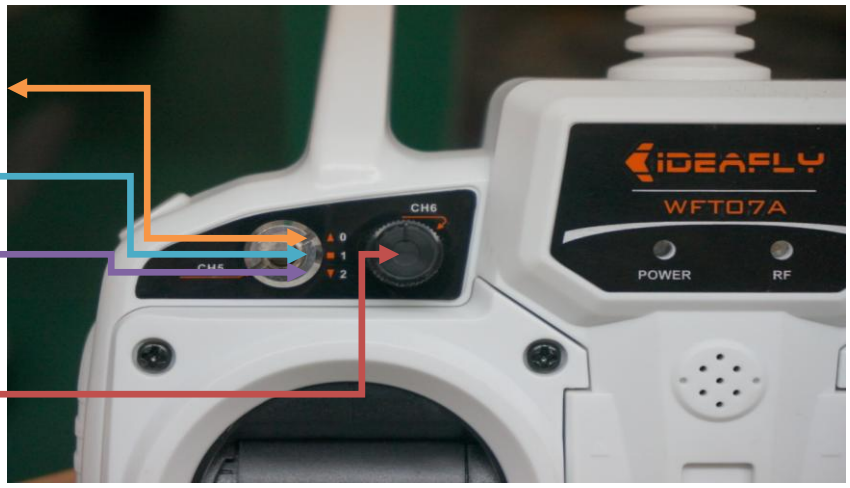
CH5 (position switch)

0 Manual stabilization

1 Auto hover

2 RTH & Land

CH6 knob: Head free

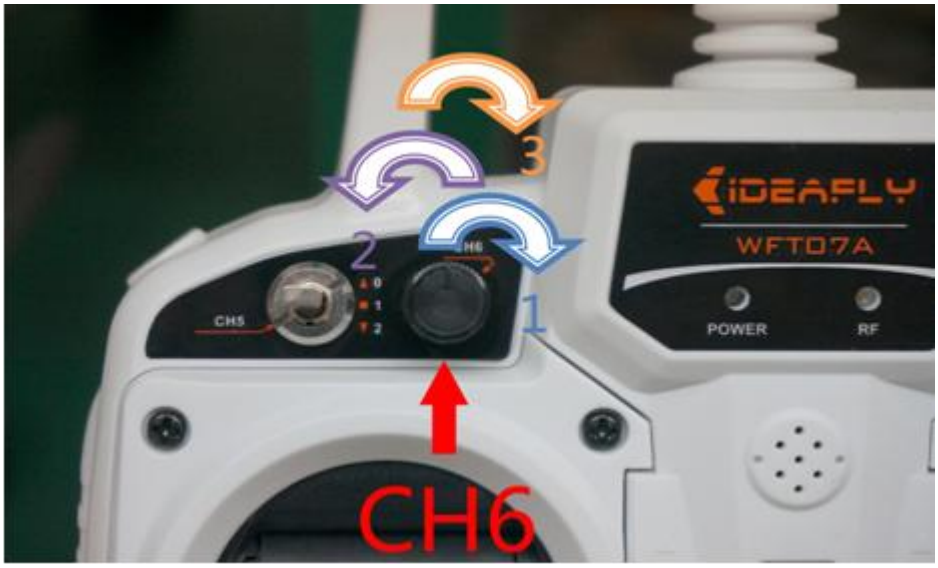


CH5 switch	0 position	1 position	2 position
Mode switch	Manual stabilization	Auto hover	RTH&Land

1) Head free mode instruction

When flying with auto hover mode, once the head free mode being active, current aircraft head direction would be defined as the following forward direction.(though the aircraft direction change under head free mode but move forward according to the defined direction)

2) How to active &deactivate Head free mode



Shown as above : 1. turn the CH6 knob to maximum, 2. then turn the CH6 knob to minimum, 3. then turn the CH6 knob to the maximum again, Head free mode will be active when this three turning operated, the same operation to deactivate the mode.

3) Notice of the CH6 knob

Please note that CH6 knob is not only for the Head free mode activate & deactivate, but also for the camera mount pitch angle control, so it is normal phenomenon when you are turning for the mode activate or deactivate, the pitch angle will change at the same time, you can adjust the camera mount angel after the activate & deactivate.

3、Brief procedure for reference

Step1: download the “IFLY-C6W GCS” from the official site.

Step2: Please do read the manual to gain a general understanding

of the relevant situation of the hardware and software, and it is also a good way to connect IFLY-C6W to the PC via USB cable to learn about the working general situation of this autopilot system.

Step3: Install the hardware parts (note: take off the propellers or power off during the installation), please reference to the red LED indicators blinking status tells the wire connection correct or not.

Step4: Configure parameter through the parameter adjusted software. When finished configuration, plug the battery and supply power to the aircraft (do not install propeller for safety), push the throttle joystick a little to make the motors rotating slowly (note: TX must be trigger before the motor can rotating), check and confirm whether the performances especially the mix control in a switch of the aircraft act the same with the setting.

Step5: Calibrate the compass with TX (note: do not calibrating in the strong magnetic environment).

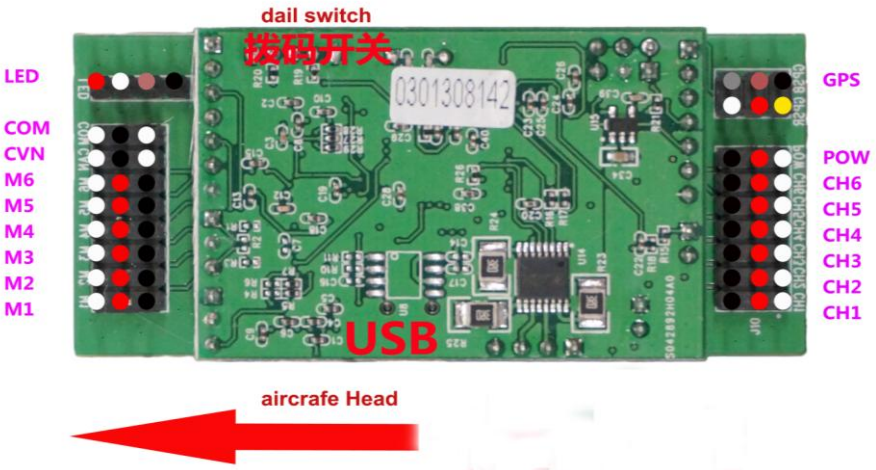
Step6: Try to fly the quad copter into the sky.

TIPS:

For safety consideration do not fly or test IFLY-C6W system with your aircraft in the strong magnetic circumstance such as mine, buildings for the compass is easy to be interfered, also do not fly in the crowds. Do not update or import any parameter at random.

Hardware Interface

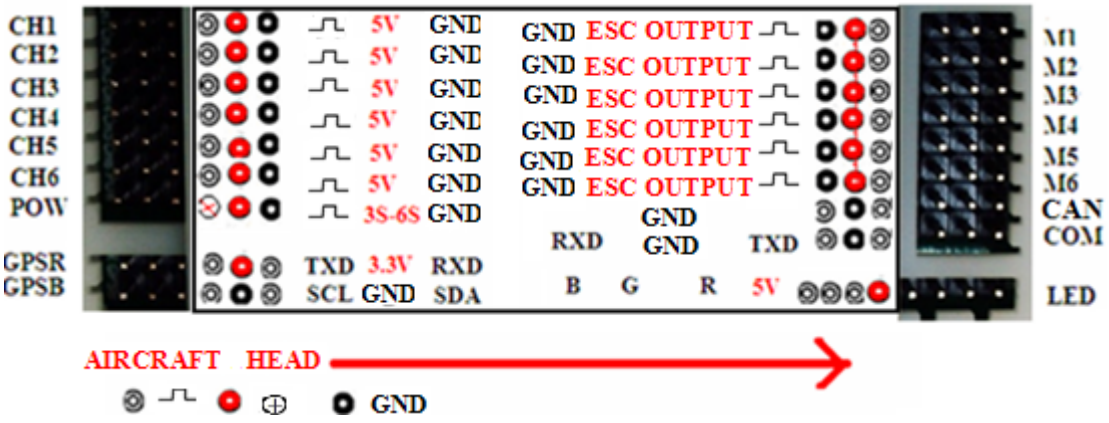
1. The whole view can be seen as below:

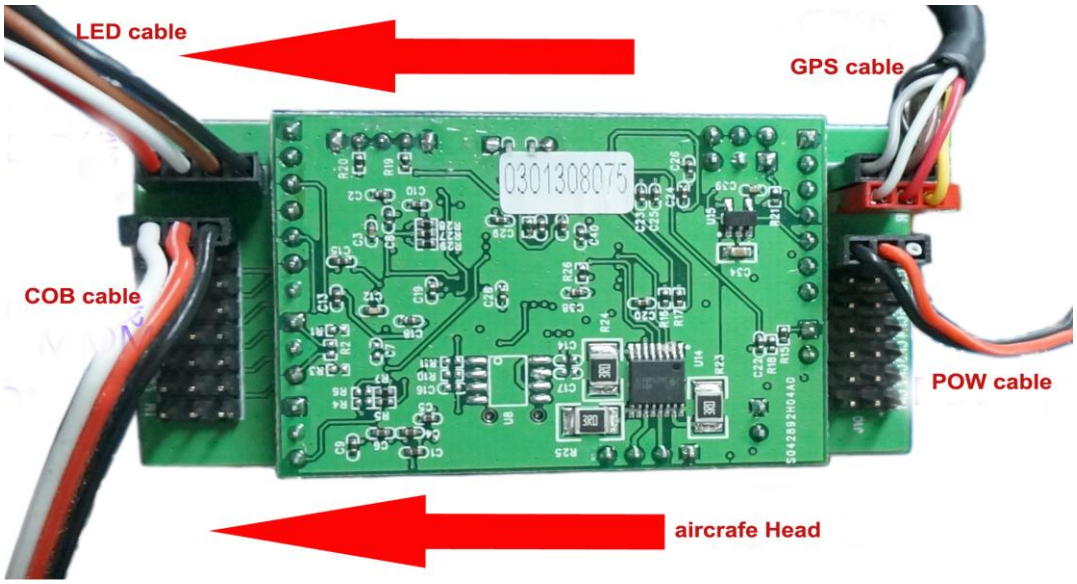


2. Interfaces and functions

Interface	Interface function	Interface	Interface function
CH1	To AIL of RC Rx	M1	To ESC of Motor1
CH2	To ELE of RC Rx	M2	To ESC of Motor2
CH3	To THR of RC Rx	M3	To ESC of Motor3
CH4	To RUD of RC Rx	M4	To ESC of Motor4
CH5	To CH5 of RC Rx	M5	To ESC of Motor5
CH6	To CH6 of RC Rx	M6	To ESC of Motor6
POW	To 3S-6S battery	CAN	Reserved
GPSR	To GPS port1(Red terminal)	COM	To RS232 COM port of PC or WIFI module
GPSB	TO GPS port 2(Black terminal)	LED	To LED module

3. Definition of Each Pin

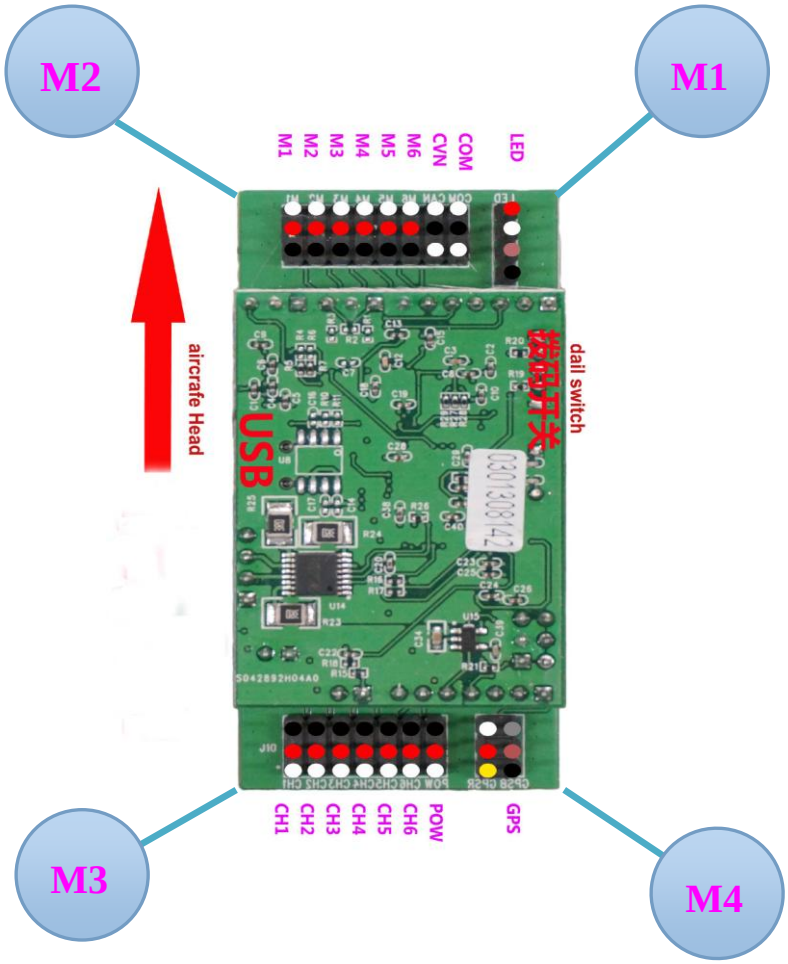




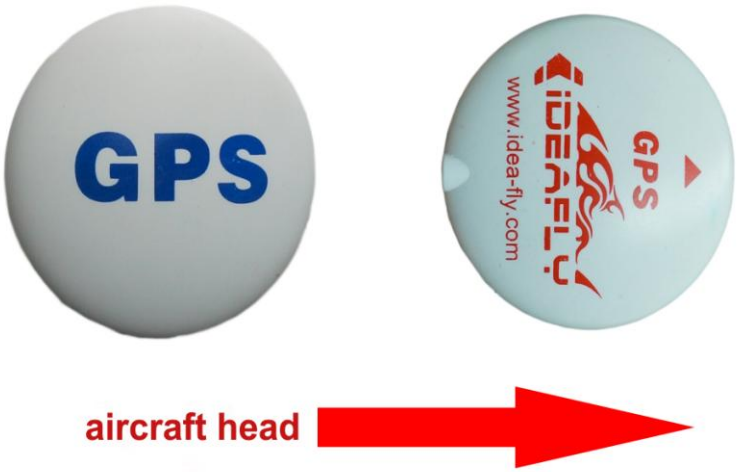
Note: There are two lines of pins at the GPS interface, 3 pins per line, totally 6 pins. There is one line of pins at the LED interface, totally are 4 pins. The anode pin of the GPS interface is at the middle position of the red terminal (GPSR port), the anode pin of the LED interface is at the outside.

4. Notice of cable connection

① the connector of the M1-M6 should point to the direction of the aircraft head, show as below:



② When install GPS&COMPASS module, the arrow printed in the shall should point to the head of the aircraft, shown as below:



③ There is already built-in UBEC module in IFLY-C6W, supply power 3S-6S, flight controller battery should be plugged to the POW connector directly. Do not supply power to RX additionally.

④ the autopilot system should be placed level on the main board of the aircraft, otherwise there would lead to inaccuracy in status measures. If the aircraft tend to fly in one side, please check and confirm whether the autopilot was settle level.

⑤ The GPS module should be placed and leveled on a higher place, and kept far away from the devices that can generate magnetic field, such as cables, transmitters, camera without shells, etc. If the GPS can't help to position located, hovering, or fly in circle, please check and confirm whether the GPS&COMPASS module was being interfered by manganic.

⑥ The barometer has been covered with a sponge in the factory, **to**

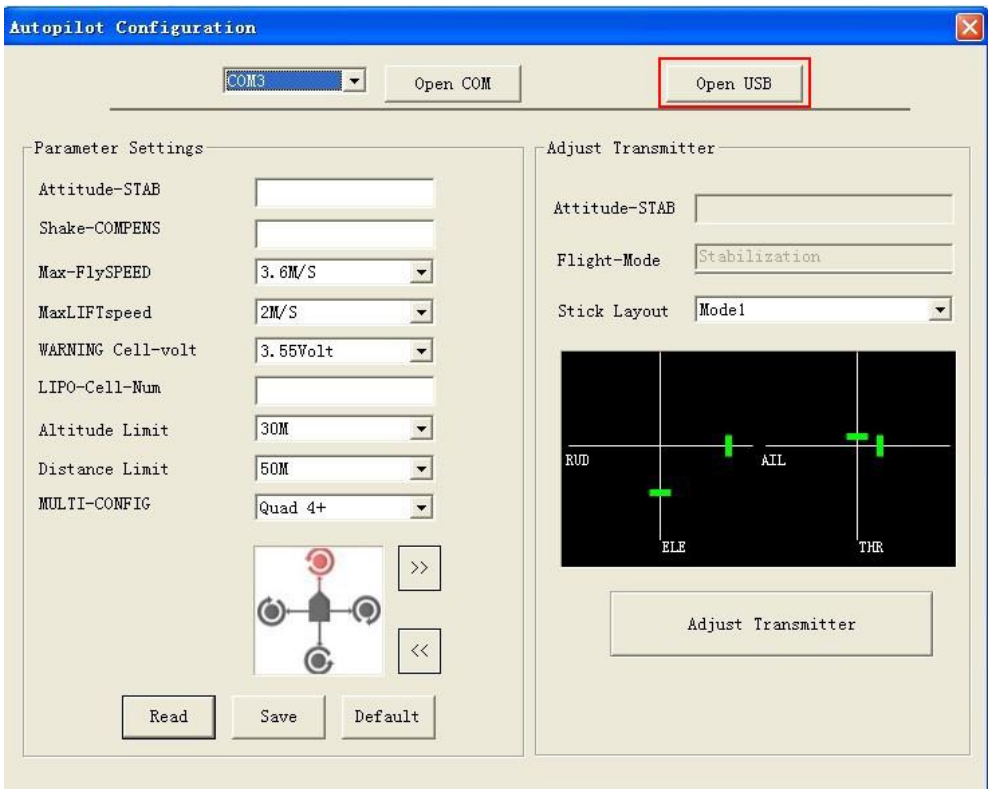
block the light that can influence the flight performance greatly. DO NOT remove it if not necessary. Cover it with other things if the sponge is gone.

5. How to check whether the cable connections are all correct.

Supply power to the aircraft and push the CH5 position switch to 0 position also as the stabilization mode, there must be a red LED indicator blink three times periodically before the GPS locate the position if all the cable connect in a right way.

Configuration software

1、Click “Open USB” button



2、Look through the main interface of the configuration software

Click “read” button, and download the current parameters from the AP. Normally, the default parameters are good enough for the flights.

Most of the time, there are only 2 items needed to be adjusted carefully. That is,” attitude stability” and “shake compensation”.

Edit the parameters based on the current values, and then click “Save” button to upload the newest parameters to the AP. If you want to restore the default parameters, then you need to active the stabilization mode, and push the THR stick to the bottom, and click “Default” button after that.

3. Configurate Parameters

Step1: Ensure the GPS module has been connected firmly. Ensure the dial switch has been pushed to the side of the GPS interface, and ensure the THR slider shown in the main window of the configuration software is at the bottom position. If the THR slider is not at the minimum position, then connect the transmitter and the receiver, and push the THR switch to the bottom.

Step2: Select the aircraft type through the “MULTI-CONFIG” drag-down menu, should select the suitable item according to your real choice.

Step3: Select the altitude limit and distance limit. If you want to test it in your eyesight area, then you can select 2 smaller values, e.g.: altitude

limit =30meter, distance limit=50meter.When the aircraft has reached the limit line, it will return to the home point automatically.

Step4: Set the “LIPO-Cell-Num” and the “WARNNING Cell Volt”. To the “LIPO-Cell-Num”, input 4 when using a 4S battery, input 3 when using a 3S battery. To the “WARNNING Cell Volt”, normally select 3.65, select a smaller value when using an old battery, select a bigger value when using an new battery.

Step5:Set the “Max-FlySPEED” and the “MaxLIFTspeed”.If the feel is too soft then select a bigger value.

Step6: Then adjust the “Attitude-STAB” and “Shake-COMPENS” in the outside.

Default parameter: Attitude-STAB=45, Shake-COMPENS=20”.

Both the minimum values of these two items are 0, an the maximum are 255.

Normally, fly with the default parameters at first. Hover it, observe the flight performance and then adjust the parameters. If it sways too much, then increase the “Shake-COMPENS”, till it is more stable. When the value is too big, it will sway in high frequency, then reduce the “Shake-COMPENS”, and adjust the “Attitude-STAB”. Fly it in a straight line, if the flight is not so stable, then increase the value. When the value is too big, it will sway in high frequency, then reduce the value.

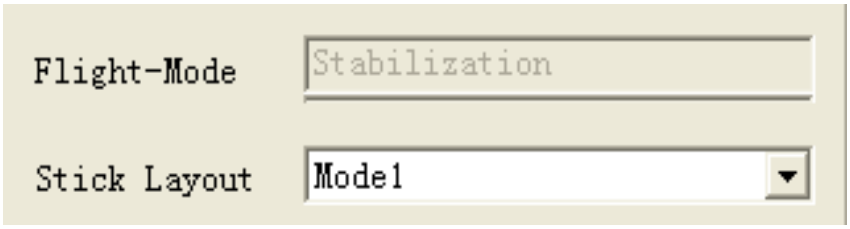
4. Adjust the transmitter

Step1: Transmitter simple adjustment

Set the transmitter to fixed wing mode, and cancel all the mixing settings in all channels. Cancel all reverse settings in FUTABA transmitter, and reverse all channels in JT and WFLY transmitter.

Step2: Activate / Deactivate the working mode

Ensure the GPS module has been connected. And check if the changing of the working modes is normal or not.



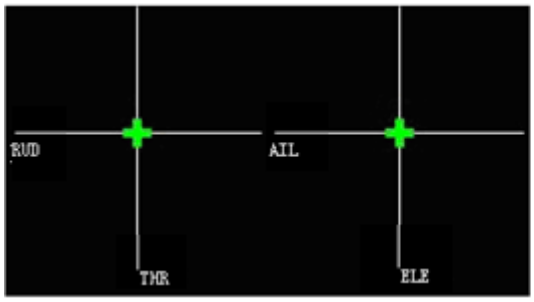
For example, when CH5 is at position 1 and CH6 is at position 2,the flight-mode in the configuration software will show “Stabilization”. If not, please check the hardware connection or the transmitter settings.

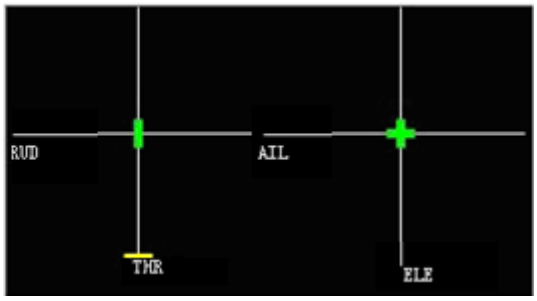
Step3: Check F/S settings

Set the F/S settings according to your transmitter manual. For S4 AP,CH5 set to position 2,CH6 set to position 2,THR set to position around 50%.Then check :close the transmitter, and the “flight mode” should be changed to “Return and Land”/

Step4: Calibrate the reverse setting of the stick channel

Firstly, select the right stick layout.

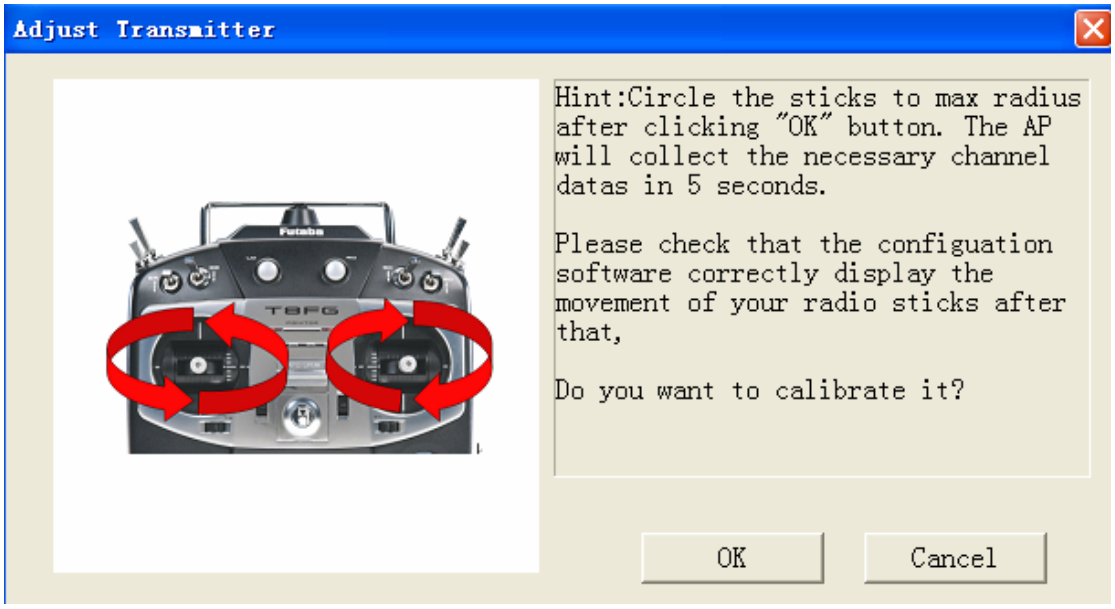




Note: the drag-down menu can change the display mode on the screen only, it cannot change any settings in the transmitter and the AP.it is a normal that you need to select "mode X" every time when loading in the configuration software,

Then push the two switches to see if the slider can move in the same way with them or not. If not, then check if the wires order is right or not. Otherwise, check the reverse setting in the related channels in the transmitter.

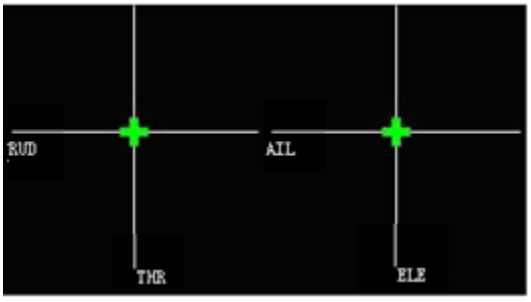
Step5: Calibrate the neutral position of the switch channels

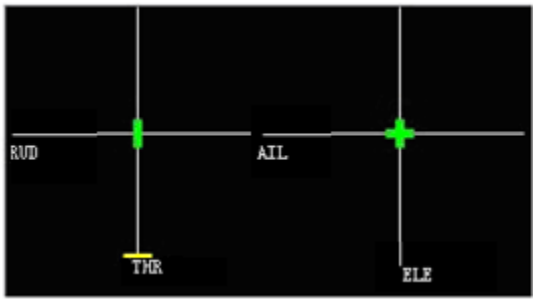

Adjust Transmitter
Hint:Circle the sticks to max radius after clicking "OK" button. The AP will collect the necessary channel datas in 5 seconds.
Please check that the configuation software correctly display the movement of your radio sticks after that,
Do you want to calibrate it?
OK
Cancel

Click "Adjust Transmitter" button, and the "adjust Transmitter" window will come out. Read the message in the right part of the window,

and click “OK” button. Then follow the picture in the left of the window, circle the two sticks along the biggest radius **in 5 seconds**. The AP will collect the maximum and minimum position value of each channel, and calculate the related neutral value out.

Then back to the main window and check the situation of the four channels in the “stick layout”. The related slider of each channel should be green color when it is in the middle position, and be red color in the other positions. Specially, the THR slider should be yellow color when it is in the button, and be blue color when it is in the hover position (normally near the middle position).





If not, then execute the operation to adjust the neutral positions.

Note: If the aircraft cannot hover well after adjusting the trims, then you can execute the adjustment operation one more time.

Fly testing

1. **Calibrate the magnetic field**

When the IFLY-C6W is set up for the first time, you need to calibrate the magnetic field before flying it to the sky. Other conditions that need to

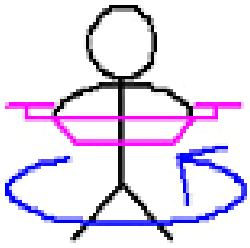
calibrate the magnetic field: the electronic components had been moved, or the aircraft moves in strange route.

Please do the calibration outside. DO NOT do it near places that can generate magnetic fields such as buildings or cars.

The calibration steps are listed as below

Step1: activate the stabilization mode, that is, CH5 at position 0.Then **quickly** move the 2 way switch of CH5 in the order of "1-2-1-2-1-2" totally 3 times. The horizon calibration starts.

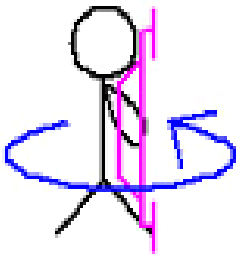
Step2: level the aircraft (e.g.: hold it in arms), Ensure the blue light is solid on (the attitude deviation should be less than 3 degrees), then turn it in 2 to 3 circles. Keep the blue light solid on during the circles. If the blue light is off, then pause and adjust, and continue to turn when ready.



Step3: activate the stabilization mode. Then **quickly** move the 2 way switch of CH5 in the order of "1-2-1-2-1-2" totally 3 times. The vertical calibration starts.

Step4: put the head of the aircraft downwards to the ground(e.g.: hold it in arms),Ensure the blue light is solid on (the attitude deviation should be less than 3 degrees),then turn it in 2 to 3 circles. Keep the blue light solid on during the circles. If the blue light is off, then pause and adjust,

and continue to turn when ready.



Step5: activate the stabilization mode. Then **quickly** move the 2 way switch of CH5 in the order of "1-2-1-2-1-2" totally 3 times. Then the procedure of the recorded data starts. The purple light will flash regularly (solid for 2 seconds and then off for 1 second).**The calibration is finished when the purple light is off completely.**

2. **Motor Arming & unarming**

1) How to arming the motor

IFLY-C6W will lock the motors in normal time for security reason. You need to execute the CSC (combined stick command) to arm the motors.

The detailed CSC operation is: push the RUD stick to the left, push the ELE stick to the bottom, push the AIL stick to the right, THR stick to the bottom.

For the layout with the left RUD, that is mode 1 and mode 2, you need to use the inverted V operation, for the layout with the right RUD, that is mode 3 and mode 4, you need to use the V operation.

After the CSC operation, you need to push the THR stick a little to turn the motors on. If you do not take off the aircraft, some kind of motors will reduce speed, even shut down. It is a normal event. You can push the stick to a far position and then take off it.

Note: the motors will be shut down if you do not push the stick in 5 seconds after doing the CSC. You need to redo the CSC to are the motors.

2) **About the unarmed motor**

①Unarm normally

Active the stabilization mode, and pull the THR stick to the bottom, then the motors will be unarmed.

But the motors will not stop immediately when the THR stick is at the bottom in GPS mode, they will reduce the turning speed to reduce the

altitude first. You had better to active the stabilization mode when the craft has been landed. And you need to keep the THR stick at the bottom for a while, then the motors will stop and unarm after that.

②Forbidden Operations

DO NOT active the stabilization mode and pull the THR stick to the bottom when the craft is still in the sky. DO NOT pull the THR stick to the bottom before activating the stabilization mode. The craft will crash for 100% this time, so do not try it!

3. working modes: stabilization auto hover, return and land

① **stabilization**

In the stabilization mode, the FC will keep the stabilization of the craft during the flight. But you can intervene the flight anytime. The final result is decided by the combination of the manual intervention signal and the stabilization signal.

IFLY-C6W focuses on the flight stabilization and ignores the violent flight, and we recommend you not to do big movements via stick commands. **Ensure the craft is stable enough before active the GPS mode.**

You can change to stabilization mode to avoid some danger when the flight situation is not good. **But please remember, do not pull the THR stick to the bottom in stabilization mode when the craft is in the sky.**

② GPS positioning & Auto hover

1) Landing spot identified

IFLY-C6W will identified the currant spot which was first positioning by GPS as the landing spot, it is better to put the aircraft to the ground and wait for the GPS positioning completed before takeoff.

The FC will control hold the position and altitude when it is working in auto hover mode. But you still can intervene the flight via the sticks.

2) Semi-auto launch

You can use a semi-auto launch function in auto hover mode. Active auto hover mode when the GPS has been located. Then arm the motor, and push the THR stick, the craft will take off and climb to 2-3 meter altitude and hover there when the stick position is above 50%.

3) Auto hover

The FC will control hold the position and altitude when it is working in auto hover mode. But you still can intervene the flight via the sticks.

You can use the AIL stick to control the movements between left and right, use the ELE stick to control the movements between back and forth, use the RUD stick to control the direction movements, and use he THR stick to control the altitude movements.

Normally, the craft will hover automatically when the THR stick is near the middle position, and rise up when it is above the middle position, and drop down when it is below the middle position. By this way, you can let the craft to stay at any altitude in the altitude limit range.

Similarly, you can let the craft stay in any place in the distance limit range via the sticks.

③ Return and Land

In the return and land mode, the FC will let the craft RTL automatically. But you cannot intervene the flight via the sticks before the craft reach the overhead position of the home point. You can change to stabilization mode this time, but the auto hover mode cannot take effect, that is, the craft will still fly to the home point if you change to hover mode this time.

The craft will land slowly after arriving at the home point. Then you can intervene the flight via the sticks to find a better landing place. Please note, the THR channel can be controlled by the autopilot only.

The motors will stop and lock after landing. But you need to keep the THR stick at the bottom position for a while. Better to change to stabilization mode immediately.

Suppose the craft is beyond 25 meters away from the home point. The craft will raise to 20 meters altitude first, and then execute the RTL mission later if the current flight altitude is lower 20 meters. But if the current flight altitude is higher than 20 meters, then it will try to keep the altitude during the flight to the home point.

We recommend you not to active the return and land mode when the craft is too close to you, because there is no enough time for the craft to

response that any accidence can occur easily.

④ **Other notes**

1）Notes to active the GPS mode

For some reason (eg: adjust the trims during the flight),the hover position in stabilization mode may not the same to that of the hover mode, so you need to care the THR position and keep it at a higher position to avoid the crash when change the working modes from GPS mode to stabilization mode.

2）About the altitude limit and the distance limit

The maximum flight altitude of IFLY-C6W is 100 meters; the maximum flight distance (radius) of IFLY-C6W is 300 meters. No matter in stabilization mode or in GPS mode, the craft will fly to the home point immediately when it reaches the limit line.

The FC will consider CH5 is at position 2 and all the stick channels are at the middle position. You cannot intervene the flight before the craft reaches the limit range. But after it backs to the limit range, you can control it via the sticks again.

Please note, we are talking about the relative altitude here. For example, if the craft was launched at the top of the mount, the altitude limit includes the 100 meters up to the sky and the 100 meters down to the ground.

4. LED indicator state

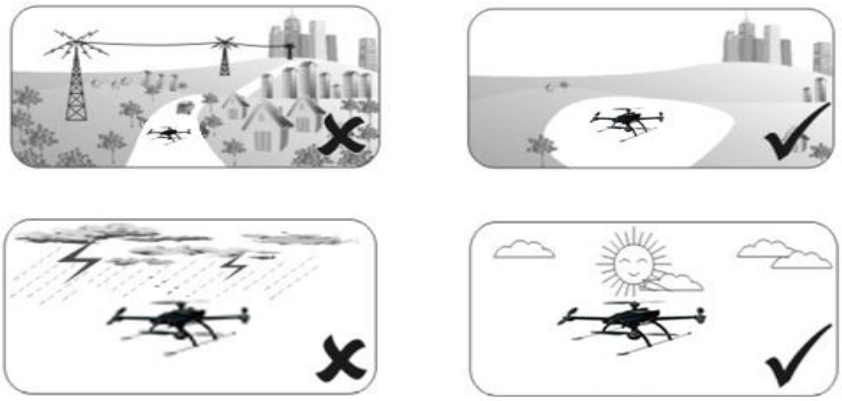
1) Normal indicate

status	LED indicator blinking situation
No positioning	
5 satellites	
6 satellites	
7 satellites or more	RED LED indicator no blinking
No positioning & user operating	
No positioning & current altitude identified	
Position & user operating	
Position & current altitude identified	
Low voltage warning	
Low voltage warning	

Warning and Caution

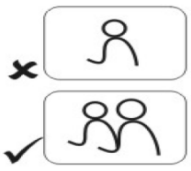
Away from buildings and people

RC models are dangerous when they are working or flying. Incorrect installation, broken components, malfunction or even slight improper operation may incur serious injury or damage. Users should ensure the safety of the flight and stay away from crowds, and taking responsibility for any accidents.



We strongly recommend at least 100m*100m flying field without obstacles like crowds, high buildings, high-voltage towers/lines, woods or any other similar objects, to avoid any damage(s) or injuries caused by accidents.

Do Not Fly It Alone



Beginners should be accompanied by an experienced pilot.
Do not fly it alone no matter how experienced or not.
Simulator software available seperatly for practice is recommended.

Away From Working Parts

Do not touch any moving part, especially the rotating blades while in flight.

Keep Away From Exposure to Wet Conditions

The quad copter consists of a lot of complicated electronic components, keep it away from exposure to wet conditions. Do not fly it in wet weather like rainy, snow, lightning storm, fog, and hail or windy (no more than moderate breeze).
Prevent any wet substances like water or steam from getting into the quad copter.

Keep Away From Heat or Radiation

Fuselage was made out of ultra-strength plastic, please keep it far away from heat or radiation which may lead to fuselage aging, erosion or even melting.

Hope you enjoy your new Quad Copter!!

Idea Fly Team

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